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Narcissus and the Moon: Parallax in Early Modern Images

Narcisse et la lune : la parallaxe dans les images de la première modernité

Davide Messina

AUTHOR'S NOTE

This essay expands on my paper “Don’t think, reflect! Parallaxing Narcissus in Baroque science and arts”, presented at the 12th AISV-IAVS Conference (Lund, August 22-24, 2019). My special thanks to Maria Giulia Dondero.

“What would it have looked like if it had *looked* as if the Earth turned on its axis?” (Anscombe 1971: 151).

1. Introduction: minimal complexity

- 1 After the formal experiments and excesses of the late Renaissance, as suggested by Erwin Panofsky, the Italian Baroque marked “a reversion to nature, both stylistically and emotionally” (1995: 36). Instead of striving to regain a form of classical balance, a new naturalistic paradigm was developed by realigning the arts with the Aristotelian view that “nature is the principle of movement and change” (*Physics* 200b12). The Florentine painters of the fifteenth century served as an unlikely model for the visual arts of the Copernican revolution. More than motion as a “mere change of place”, as Bernard Berenson explained (1896: 50-56), the representation of *movement* paved the way for a new aesthetics that not only imitates life, but enhances the “sense of vitality”: the artist extracts the “significance of movements”, simulating action in our mind through an interplay of *memory and imagination* that is (or feels) more intense than real life; in other words, “we imagine ourselves imitating all the movements, and exerting the force required for them—and all without the least effort on our side” (*ibid.* 55).

- 2 Commenting on Berenson's "theory (if it can be called that)", David Freedberg pointed out that there is still limited research by art historians on "the felt imitation of the representation of movement and action in a work of art, or in images more generally" (2009: 73). This is surprising, if we consider the obvious relevance of this research for art history; but even more so, if we look at the extensive work carried out by the cognitive sciences on this topic, and the implications of the recent discovery of "mirror neurons" for the arts (*ibid.* 73-74). Interdisciplinary research on the *significance and representation of movement* in the visual arts, however, can be well supplemented with semiotic studies. By endorsing the "double reference" of *sense* between *perception* and *meaning-making*, as Victoria Welby suggested at the turn of the last century (1983: 48), semiotics represents "a bridge between the humanities and the sciences" (Perron *et al.* 2000), and its diverse tradition offers some of the most comprehensive approaches.
- 3 The question of the semiotic nature of mirrors is instrumental to the analysis of this study. A standard reference is the work of Umberto Eco, who devoted several essays to explaining why "the mirror image is *not* a sign" (1986: 202), and why this is a *positive* principle for semiotics. While holding a "rear-view mirror" to the development of *visual semiotics* (Fabbri 2002), his arguments also open a window to explore alternative views in *cognitive semiotics* (Sonesson 2003), most notably on the formation, functioning, and performance of *self-awareness*. After all, semiotics is not just about the definition of a sign. Eco uses the myth of Narcissus to argue—as far as we can "trust myths"—that the experience of mirrors and signs are "linked to one another in a circle", but within the spell of this circular argument (or assumption) we remain uncertain on "whether semiosis is at the basis of perception or vice versa" (1986: 202-203). Leaving aside the debate on criteria and definitions, the *circularity of the question* is productive across different disciplines. In particular, this question is directly relevant to the early modern history of painting: Narcissus emerged in the Renaissance as the "inventor of painting" (Alberti 2011: 46), and semiotics shares with this invention, from the beginning, the art of turning "absence into presence" (Damisch 2010: 304).
- 4 The understanding of mirrors as a "potential semiotic kernel" of the pictorial arts, as suggested by Yuri Lotman (1990: 55), is one way of *rethinking painting* in the early modern period. Not only mirrors contributed to the modern development of *perspective*, but they raised the awareness of the *presence and position of an observer* in an image. In visual semiotics, the model of "uttered enunciation" (*énonciation énoncée*) offers a dynamic, advanced, and nuanced methodology to study "the relationship between the image and its observer as inscribed within the image itself" (Dondero 2020: 2). Drawing from linguistics, where *enunciation* describes the passage from a *virtual language system* to an *actual utterance*, the presence and position of an observer in an image can be derived from certain traces of the process that mark the *subject, space, and time* of enunciation (*I, here, now*) at both ends of the *production and perception of an image*. Unlike a linguistic structure, however, the *imitation of a moving observer* in the visual arts foregrounds the forms in which an *image sees itself as a moving image*, as it will be discussed. It is a case of "impersonal enunciation", as Christian Metz explained it for film theory, and it unfolds "by means of *reflexive constructions*" (2016: 10), namely through an *internal splitting* of the image. This *impersonal and reflexive* mode of enunciation reframes the question of the semiotic nature of mirrors in a way that is positively consistent with Baroque painting and visual culture at large, where the

“subjective space” of the observer is reconfigured and experienced from the *point of view of the image* (Fontanille 1989).

- 5 Research on *optical devices as apparatuses of enunciation* reveals a major yet still largely understudied phenomenon in early modern images, namely the presence of *parallax effects*. The parallax is “the difference in the projection of a static scene as viewpoint changes relative to the scene” (Wilson & Keil 2001: 227), namely the *apparent movement* of an object relative to a given background, as caused by the movement of the observer. The proverbial idiot who looks at the finger, when it points at the Moon, can see this effect simply by moving the head, or by looking at the finger one eye at a time: a *differential perspective* is projected onto the finger, which appears displaced relative to the Moon. Parallax and *distance* are inversely proportional, and so the movement of the observer must be much more significant to produce an apparent displacement of the Moon. This phenomenon has intrigued philosophers over the centuries, from Aristotle to Slavoj Žižek. It suggested an effective method to measure distances, but it also contributed to question the *semiotic difference* between objective and subjective space in images. With Žižek, we can also define it as a “minimal difference which divides one and the same object from itself”, namely as a difference that appears “as such” (2006: 18).
- 6 From a cognitive point of view, parallax cues are integral to our *sense of reality*. This is particularly relevant to differentiate mirror images, which are affected by parallax like the *real* things that we see in reflection, from two-dimensional images like paintings, which do not seem to change when the observer moves. In fact, when seen from different angles, two-dimensional images also display an *apparent movement relative to themselves* (Hochberg 1994: 55)—like the eyes of a portrait that seem to follow us around the room—, but this may not be immediately obvious. Because of their elusive nature, parallax effects in painting are generally considered *absent* before the avant-gardes, when they are exaggerated to capture the experience of a moving observer; and they have not been studied in relation to the visual arts until the invention of the motion pictures, where they sustain the illusion of reality. The reasonable oversight should not be taken for an argument. To see the ways in which these effects appear in the visual culture of the early modernity, we should consider how the felt imitation of movement emerges in *reflection*, and how the *transformations of the point of view* are enunciated in images.
- 7 The early modern period provides a unique and critical context for this research. As it will be argued, the *uncanny realism* of Baroque painting proceeds from a system of *artificial parallax*, which challenged and changed the “period eye” of the Renaissance (Baxandall 1988: 29-108). Nothing like the radical symbolic shift that displaced the observer from the centre of the universe, as the Copernican revolution did, could have made the arts of time and space converge in *images of a world in motion*. By positing motion as the “paramount analogy” of *sense*, as Welby suggested (1983: xvii), aesthetics and semiotics shared the knowledge of “how thinking in the round and in motion like our earth, differs from thinking on the flat and the fixed” (*ibid.* 233). In astronomy, the *absence of observable parallax of the stars* was debated with dramatic consequences, as the decisive yet elusive *demonstration* of the Copernican hypothesis: “To prove that the Earth in fact revolved in a wide orbit around the Sun,” as Alan Hirshfeld explains, “the parallax of just one star—any star—had to be detected. The hunt for stellar parallax was

on” (2013: 47). We can hardly justify the assumption that the visual arts remained indifferent to this pressing debate in the science of cosmic appearances.

- 8 The Moon held a crucial position in the early modern hunt for stellar parallax, at least for three concurrent reasons. First, it manifested the *sweet spot of the observable parallax* in the universe. While the parallax of the Moon could be readily measured with observations from two distant points on Earth, because of the distance, not even the early telescopes were powerful enough to detect any apparent displacement of the celestial bodies beyond its sphere. Second, in the pre-Copernican universe, the Moon marked the threshold between a *motionless* Earth, subject to *time and change*, and the movement of the heavenly, eternal and ethereal spheres. This is a semiotic threshold: the Moon “signifies in us” (*in nobis significat*) the “continuous movement of the soul and the body”, as Marsilio Ficino wrote in a letter (Gombrich 1972: 41). Precisely because it represented a *limit of knowledge* and a *semiotic principle* informed by change and motion, the *interpretation of the Moon* was a benchmark for parallax thinking in the wake of the Copernican revolution, namely for the ways in which we *signify our movement in our vision of the universe*. Third, the Moon had been classically imagined as a *cosmic mirror* of the Earth. While this idea had been long disproved (and even derided), still in the seventeenth century Galileo had to demonstrate that the Moon could not be like a mirror at all; at the same time, his telescopic observations reflected a new vision of the Earth and the arts at once: “Wrong in one sense, those who viewed the Moon as a mirror were right in another” (Montgomery 1999: 117).
- 9 Cultural images are often persistent because they are nested in natural language and common sense, preserved and transmitted in myths. Classical mythology connects the liminal position of the Moon to the goddess Artemis (or Diana), who was also the goddess of the hunt. It was Artemis who turned Narcissus into the “eager hunter” (*venandi studiosus*) of his own reflection (Vinge 1967: 23). The image of the Moon as a cosmic mirror of the Earth acquires here another dimension—and the interpretation of *The Face that Appears on the Moon*, as Plutarch discussed it in his dialogue, is transformed like that of the beautiful hunter. In a reverse myth of the “protophilosopher” (Blumenberg 2015) who saw in water the principle of all things, and ironically tumbled into a well while watching the stars at night, Narcissus discovers the universe in a dark pool, staring at his own eyes like “twin stars” (*geminum sidus*), as Ovid writes in the *Metamorphoses* (III, 418).
- 10 To sketch the conditions of *minimal complexity* for a theory of parallax in early modern images across the arts and sciences, this essay puts forward two overarching arguments. First, it contends that the debate on stellar parallax informs, integrates, and transforms the *theory of perspective* in the late Renaissance. Second, it argues that the parallax view sheds new light on the *representation of movement* in the Baroque visual culture. After outlining how the semiotic use of mirrors in painting enabled the possibility of representing the change of perspective, this essay shows how this process intersects the general view of the Copernican revolution, inscribing parallax effects in images with an intentional aesthetic force. As painting reduces the background to a dark cosmic surface, parallax effects appear through *minimal, reflexive displacements* of the object and the observer within the same image. This framework is developed with a focus on Giordano Bruno’s *art of memory*, where the parallax view enables a semiotic “embrace” (*complexus*) of the *movement of images*. In painting, analysis focuses on

Caravaggio's *Narcissus* (ca. 1597), where the observer reflects the point of view of an image that appears motionless but sees itself as a moving image.

2. Renaissance in perspective: speculating on ornaments

- 11 In the Renaissance, the development of *linear perspective* provided painting with a “plastic space” that remained apparently unchanged until the avant-gardes (Francastel 1963). Forces and actions were under the rule of a *fixed point of view*. The semiotics of this space, however, laboured and transformed the early modern visual culture from the inside out. As argued by Heinrich Wölfflin, *plastic values* emerged more vividly from *movement* than from masses, from *shadows* than from lines, manifesting a certain “tension” (*Spannung*) between the *meaning of forms* and the *sense of the whole*: a distinct “sense of direction” (*Gefühl für Richtung*) will characterize the *painterly style* of the Baroque (1964: 58). The growing significance of the *ornaments* is instructive, and it extends far beyond Donatello's invention of the *putti* as “ornament in action” (Dempsey 2001: 34). In architecture, a compelling example is in Michelangelo's vestibule of the Laurentian Library (1524-1534), where the pilasters that frame the aediculae, intervalled by pairs of receding columns, “become wider as they expand upwards, and seem to rise more quickly than straight unexpanding ones” (Wölfflin 1964: 59). An *ornamental line* comes to the foreground from the edges, and its acceleration signifies a movement directed towards the observer.
- 12 The transition to the new style is more organic than the narrative opposition could make one assume. Like the seemingly decorative scroll at the top of the title-page of the *Well-Tempered Clavier* (1722), which is in fact a diagram of Bach's secret tuning system, the Baroque art of the ornament developed and *tempered* some essential motives of the Renaissance. In paintings such as *Birth of Venus* and *Spring* (ca. 1482), Botticelli gave new significance to *inanimate objects* like hair, drapery, flowers or foliage to tackle “the most difficult problem in all art”, as Aby Warburg so perceptively explained (1999: 141), namely the problem of capturing “images of life in motion” (*Bilder des bewegten Lebens*). The precision of the ornaments contrasts with the vague background, but the *forces* that animate them become visible, expanding perspective through an *impersonal narrative* of motions and emotions, actions and passions. Already with the sensibility of a Baroque musician, Botticelli's perspective hinges on ornaments as *expressive elements*, which capture movement and can *move* the observer too.
- 13 In this framework, the study of the transition from the Renaissance to the Baroque arts can draw valuable insights from Henri Focillon's idea of “speculating on the ornament” (1989: 66-68). The *speculation* has to be understood in its double Latin sense: on the one hand, the ornament is “a kind of observatory”, a *specula*, from which the “life of forms” can be observed across the figurative and plastic arts. On the other hand, the ornament is a kind of mirror, a *speculum*, which enhances the observer's perception of forms with a force of *self-signification*: not only it does “exist in and of itself, but it also shapes its own environment—to which it imparts a form” (*ibid.* 34), so that “form signifies only itself” (*ibid.* 66). The same is for the Baroque aesthetics of light and shadow, which “seems to signify something in its own right alongside form”, as Wölfflin wrote (2015: 148). Progressively, the *reflexive and impersonal function of the ornaments* reconfigures the

- definition of forms in painting too. On the painterly surface, perspectives of curved lines begin to appear, at once abstract and naturalistic like a *rinseau* in a classical frieze.
- 14 The new glass mirrors that became available in the Renaissance were pivotal to the creation of this new sense of direction in painting. As opposed to polished metal, the new glass mirrors offered a much clearer reflection, and what this *meant* for modern perspective was even more consequential than what they *made* as optical devices. In fact, the “popular standard for measuring pictorial ‘realism’” in Renaissance art, as argued by Samuel Edgerton, “was not by direct comparison to the phenomenal world, but by comparison to the novelty of mirror reflection” (2009: 52). At the same time, as the mirror surface could not be immaculate, painting integrated the *marks* of an artificial device in a common framework of *reality effects*. Observers and ornaments were connected in a direct and dynamic way, fixing the marginal space of the image as a frame of reference for its depth. One of the most productive paradoxes of this situation was the raised awareness that a minimal shift of the observer’s point of view would prove the *artificial nature of perspective*, while enhancing the *sense of reality*.
 - 15 An ingenious experiment by Filippo Brunelleschi at the beginning of fifteenth-century Florence, which became the foundation *myth* of modern perspective, may serve as an illustration. According to Antonio Manetti’s account (1970: 44-46), the architect painted a small panel of about “half a *braccio*” (around 30cm), representing the façade of St John’s Baptistery in perspective, as seen from the portal of the Florentine Cathedral. Then, he turned the panel and, in correspondence of the vanishing point, he made a conic hole that was as small as a “lentic” (*lenta*) and worked as a natural *lens*. Bystanders were invited to observe the Baptistery through this little hole, while holding a flat mirror in front of the panel with the other hand. By adjusting the arms’ distance, the *reflection* of the painting would line up with the *natural perspective*, and the *virtual image* behind the mirror would coincide with the appearance of the *real* building.
 - 16 If we consider that Brunelleschi had just lost the competition to design a set of relief sculptures for the doors of the Baptistery, it becomes clear that he aimed at capturing the plastic qualities of the façade with a more profound illusion, *from life*. This may have been just a *thought experiment*, but it did not simply want to prove a new technique. With a bold conceptual step forward, he redefined the experience of pictorial realism as a relationship between two *simulacra*. We can say that Brunelleschi “put forward and actualized” (*mise innanzi et in atto*) not only perspective, as Manetti writes (1970: 43), but the semiotic potential of mirrors, by turning their use for *self-portraits* into a device for representing the *process of image formation*. The device embraces a new way of “*thinking in painting*”, as Hubert Damisch explains it (1994: 446): the “origin” of perspective is a hole that appears like a “stain” in the mirror, a mark of the *presence of an observer* behind the painting and, at the same time, of a *significant absence* that the mirror enunciates as a fiction of the image itself.
 - 17 Leon Battista Alberti’s paradigmatic metaphor of painting “as an open window” (*pro aperta fenestra*) (2011: 39) connotes Brunelleschi’s perspective as a way of “looking through” (*perspicere*) an image. This is an idea that is consistent with the medieval general definition of a *sign*, as something that “stands for” (*pro*) something else (Eco 1986: 213). At the very beginning of his treatise *On painting* (1435), Alberti defines a “sign” (*signum*) as a *minimal unit of the visible*, namely of what can be “observed by the eye” on a surface: the “point” (*punctum*) is the minimal sign, and the origin of “painting” (*pingo*) may be related to it; the *line* is a continuous sequence of points, or

the movement of a point; finally, the *surface* is a composition of multiple lines, “like close threads in a cloth” (2011: 23). As such, the window cuts through the semiotic tension of a *textum* that stands between two ideal surfaces: at one end, images appear to form in the eye “as if on an animated mirror” (*ibid.* 28); at the other end, the ultimate textual object of representation is a “story” (*historia*), aimed at *simulating and stimulating* the “motions of the mind” (*motus animi*), because “these motions of the mind are known from movements of the body” (*ibid.* 61).

- 18 We touch here on a remarkable intersection between *visual and cognitive semiotics*. As the role of movement in the perception of depth is gradually understood, pictorial perspective expands into the *significant experience* of the “active observer”, giving rise to representations of “motion perspective” (Gibson 1950: 117-144). Alberti prefers to leave such questions to the philosophers, and warns that excessive movements of the *subject of representation* produce “errors”, for instance when “in the same figure [*simulacrum*] the breast and buttocks appear under a unique view, a thing which is certainly not only impossible to do but also very unpleasant to see” (2011: 65). However, he also acknowledges that similar errors occur in medieval and modern painting alike, so there may be some stylistic reason behind them. The Baroque will come to see them as *expressive deformations*.
- 19 The semiotic use of mirrors in early modern painting shows a way to integrate a *differential point of view* in perspective and perception, enabling the representation of the observer’s movement too. Velázquez’ *Venus with Mirror* (ca. 1651) offers a good example to see a similar effect, which is now commonly used in cinema (Bertamini, Latto, & Spooner 2003): if we see the mirror image as the painted subject would see it, the mirror is looking at us. The mirror transformations of Brunelleschi’s experiment can be associated with this semiotic development. First, against a common misapprehension, it should be noted that mirrors do not rotate images on the vertical axis, reversing right and left. As explained by Eco, between the observer and the mirror image there is “the same congruence we observe when we press blotting paper onto a page written with fresh ink” (1986: 202-203)—or that of a wet “plaster mask” (*cretea persona*) slapped against a column, as Lucretius vividly described it (*De rerum natura* IV, 296-297). This means that the reflected panel could only coincide with its real object if the painter had used the image of *another mirror* as a model, otherwise the reflection would appear incongruent. The real rotation of the mirror image happens in depth, reversing front and back, splitting the observer and superimposing a form of *self-signification* on the most *impersonal optical phenomena*, like on a glass window—as Leonardo put it, perspective is a way of seeing the world as “marked” (*segnato*) from a certain point of view, as if from “behind a plane of glass” (1970: 53).
- 20 The symmetry of the Baptistry serves well this complex strategy of mirror transformations. It has not been noted that it also enters in dialogue, and perhaps more crucially, with a medieval way of representing three-dimensional space in painting, which is known as *reverse perspective*. In this style of perspectival representation, the *observer becomes the vanishing point* of the image, so that forms seem to expand towards the background, instead of converging. As it happens, below the horizon, the frontal view of the octagonal structure of the Baptistry presents the same diverging sides of a rectangular form in reverse perspective, as we can see it in the cradle of the *Birth of the Virgin* (ca. 1310-1315) in the Chapel of Studenica, Serbia (Edgerton 1975: 11-12).

- 21 At the beginning of the twentieth century, Pavel Florensky applied the aesthetics of reverse perspective to the study of the Russian sacred “icons”, which flourished in parallel to the Italian Renaissance. As we can see in Rublev’s *Trinity* (c. 1411), the sacred icons represent the world *simultaneously* from at least two points of view, from the side and from above. The two viewpoints set the icon in motion. To use the classical definition of Plato’s *Timaeus* (37d5), time itself is manifested as a “moving image of eternity” (*eikōn kinēton aiōnos*). In fact, Alberti’s perspective also assumed a *lateral point of view* of the observer above the line of the horizon, from which he drew the transversal lines that stand for the division of space in depth (2011: 41-42), but the scene is constructed and observed at rest. Renewing Alberti’s metaphor, instead, Florensky writes that the world of the icons appears as seen “from [the window] of an automobile” (2002: 269). With its *polycentric and dynamic* representation, reverse perspective emerged as one of the generative forces of modernist painting, although the technology of the motion pictures overshadowed its ascendance in the avant-gardes.
- 22 In a semiotic study on Russian icons, Boris Uspensky suggested that the cognitive structure of reverse perspective can be grasped from the way in which the *enunciation of a moving observer* is reported inside the space of representation, as it happens when children turn the sheet while drawing (1976: 43). An inspired detail in Brunelleschi’s perspective panel may point to a similar apparatus of *uttered enunciation*. Instead of painting the sky around the Baptistery, the architect glued a cut-out strip of “burnished silver” (*ariento brunito*), which reflected the passage of the clouds above the building (Manetti 1970: 45). As an ornament, this detail could be compared to the overlaid silver sheet of a Russian icon, which covers the background around the sacred subject—but its reflective quality unfolds a whole new system of image transformations, which is almost hidden above the painting like Bach’s secret tuning system. The background changes of the sky animate the mass of the building with an atmospheric tension. While the gaze moves simultaneously upwards and forwards, the faint reflection of the clouds captures the *passage of time* as a pure *difference of the image relative to itself*. Perspective is charged with a new sense of reality, forms vibrate like the silver lines of religious icons, which express invisible forces like “an electric or magnetic field” (Florensky 2002: 206). With this ornamental line of speculation, finally, Brunelleschi introduces a new metamorphosis in the history of images: in the alchemy of the silver strip, the peep show aspires to the art of the moving pictures.
- 23 Brunelleschi’s idea of turning the perspective panel must have been precisely motivated, if not imposed, by the intention of reflecting the background movement of the clouds above the Cathedral, not just any cloud in the sky. The mirror compounds the painting with this movement. We can say that the silver strip represents an “extension” (*dilazione*) of painting, as Manetti writes of the mirror (1970: 45), but also a semiotic *deferral* of the reality of movement, which sets the stage for a dramatic change of linear perspective. Against the passing clouds, the outline of the Cathedral *stands for* a certain difference in perception between the figure and the background, namely it functions as a “predictor of the effect of movement parallax”, as Ernst Gombrich explained (1982: 201). Depth is perceived with movement in still images too. This was a transformative idea, still unexplored in its originality and influence. While the mirror fixes the external observer as a *reflexive frame of reference* inside the perspective, the silver strip opens an *impersonal space for parallax*, where the image appears in

transformation relative to itself, like the clouds in the sky. The progressive understanding and use of parallax in painting gave perspective a whole new sense of direction, leading the visual arts to cross the path of a new science of the celestial motions.

3. Baroque in parallax: starry enunciators

- 24 While there are several studies on “poetics of perspective” in the Renaissance (Elkins 1994), as well as on the new sense of the Baroque for “affect and movement at all costs” (Wölfflin 2015: 92), there is little or no scholarly research on the representation of the *change of perspective*, namely on the modes of embedding *parallax* in early modern images. Accordingly, it is assumed that “motion parallax was missing from traditional art forms” (Solso 1996: 174), at least before the early cinematic experience that accompanied the modernist avant-gardes in painting, when we find such striking examples as Cézanne’s *Still Life with Fruit Basket* (ca. 1890). As plausible as it might seem, the assumption is not tenable as an argument. The lack of evidence is predicated on a certain idea of modern perspective, whose convention of a *monocular fixed observer* still conditions the way we look at images prior to the experience of the motion pictures. The transitional aesthetics of the late Renaissance will designate here a *site of enunciation* of the parallax view across the arts and science.
- 25 As a matter of fact, several examples of parallax can be gleaned in early modern art, but they may be significant without being as conspicuous. In painting, parallax effects may appear in elusive details, like the changing angle of reflection of a shiny object, or the blurred pattern of a fabric. The paragon of elusiveness is *Mona Lisa*’s smile, where the aesthetics of peripheral vision composes and conceals a diagram of the motor muscles of the lips (Windsor, RCIN 919055v), coming to life as the eyes of the observer move away from the central focus (Livingstone 2002: 71-73). Leonardo was so aware of this phenomenon that he advised to compose paintings in such a way that it would “make so little difference when the eye of the spectator moves” (1970: 273). A *minimal difference* is all it takes. We can find a subtle use of parallax already in Masaccio’s *Trinity* (ca. 1427) in Santa Maria Novella, Florence, where God’s head is not perfectly aligned with the central axis of the Brunelleschian vault, so that the observer feels slightly off-centre in front of the fresco: it is a “structural intuition”, as Martin Kemp calls it (2006: 8, 22). In contrast, we only need to consider the dome painted by Andrea Pozzo in Sant’Ignazio (ca. 1685), Rome, to see how the markedly *eccentric perspective* of a moving observer is integral to the Baroque visual culture. It is the presence of parallax tensions in the new vision of the Copernican universe that underlies the *explosion of the frame* in Baroque ceiling paintings.
- 26 In the early modern period, parallax effects are most striking when the images are produced through *projection* devices, and especially when curved mirrors are used as lenses. One of the devices that came to prominence was the *camera obscura*. It is possible that Brunelleschi used it for his first perspective painting, and Leonardo noted that, by moving the “lips” (*labri*) of its opening, as in a fleeting smile, “the images of immovable objects are made to move” (1970: 46). Parallax effects are most visible when a movement of the device alters perspective and focus. This movement introduces *distortions in the process of image formation*, but their *systemic* nature may also conceal them. Very much like the *unprepared and unresolved dissonances* that characterize the

music of this period, such deformations become *expressive* elements. The elongated necks and columns of Mannerist painting jump at us like trails of light against the night sky. This is a key feature of Baroque *realism*, which “is not an attempt to get the objects as they are, but vision as it is”, as Ofer Gal and Raz Chen-Morris explain (2013: 29); with this, a “paradoxical process” takes place in Baroque science: as the eye of the painter identifies with an optical device, the *human* observer “disappears” from optics (*ibid.* 15-16). We should add that a new observer emerges as a *subject* in semiotics, negotiating the space and the signs of objectivity.

- 27 Although we do not usually associate the Baroque arts with science, the semiotic approach allows us to see how the development and use of optical devices in painting performs the same *staged objectivity* of the Baroque scientific discourse. In semiotic terms, the traces of a process are *marks of enunciation* and produce *effects of subjectivity*. In a scientific text, these marks often tend to be erased or disguised, so that the “discourse” (*discours*) is textualized as “history” (*histoire*), as Émile Benveniste called the two basic modes of linguistic enunciation (1971: 206-209). As opposed to the discursive presence of a speaker and a listener, which is openly subjective, the evidence of a scientific text appears to *speak for itself*, as a story without a narrator. The *invisible narrator* is analogous to the “disappearing observer” in modern optics, but the rhetorical strategy also elicits Alberti’s idea of a visual “story”, which simulates action and dissimulates the act of representation.
- 28 The strategy of historical objectivity can be recognized in the anonymous address to the reader that Andreas Osiander wrote for Copernicus’ *On the Revolutions* (1543)—a book that “gave rise to a revolution that it had scarcely enunciated”, as Thomas Kuhn wryly put it (1957: 135). Osiander writes that the task of the astronomer is to compose the “history” (*historia*) of the celestial motions through careful and “artful” (*artificiosa*) observation (Copernicus 1992: xx). This work is *historical* in its reconstruction of the causes of motions in time, and it is *artful* in the formulation of hypotheses that only *stand for* the true causes, which are metaphysical and remain unattainable. Copernicus employs a comparable rhetoric when he suggests that the “motions of the stars” described in his book are only “embellished” (*ornatos*) by his “new and marvelous hypotheses” (*ibid.* xix). With a flight of etymological arguments, he notes that the Latin word for the “universe” (*mundus*) means “purity and ornament”, like the Greek *kosmos*, and the meaning of the “heaven” (*caelum*) is that of “carving” (*caelati*), as if the most beautiful forms were chiselled in it (*ibid.* 7)—in fact, the traces of the *first maker* (and *first mover*) of the universe are “concealed” (*celati*); the “course” (*cursus*) of the stars is not observable; and the *history of forms* explains itself as a *discourse of the ornaments*. Along this ornamental line of speculation, Copernicus sets the Earth in motion by inscribing the observer’s movement in a universal process of *reflexive and impersonal enunciation*, as the marked “part” of an image that sees itself as a moving image: “Whatever motion appears in the firmament is due [*ex parte*], not to it, but to the Earth” (1985: 81).
- 29 Against this backdrop, elaborating on the idea of Galileo’s *Starry Messenger* (*Sidereus nuncius*, 1610), we can say that Baroque images highlight the presence of *starry enunciators*, namely markers of the *parallax view* that challenged the cosmology of the late Renaissance. These markers are inscribed in images across the early modern arts and science as *delegated observers* (*nuncii*), as Bruno Latour explains (1999: 71-72): as for stellar parallax itself, these markers may *appear absent*, but their presence must be

supposed, and the traces of their action can be derived from the *sense of movement* that they bring into images. Like the *theōroi* of classical spectacles (Nightingale 2004: 4-5), we can also say, the “observers” are also the “messengers” of a theory that changes the experience of the visual arts; the movement of images is their *message*. The *language of observation* closely followed this transformation in visual thinking: for instance, Galileo’s discovery of four new “stars” (*stellae*) around Jupiter, as we read in the *Starry Messenger*, meant that it was possible to imagine *other moons* in the universe.

- 30 The eye of the astronomer meets the theory of painting through the new perspective device that Galileo called *perspicillum*, namely the telescope. The drawings of the Moon that he produced from his observations apply the general laws of perspective, which he had studied at the Academy of the Drawing Arts in Florence; but they also exemplify how the telescope affected representation with significant parallax effects. Some details appear distorted, exaggerated or even incongruous, mainly because of the inevitable *changes in focus* of the drawing process. Not only had Galileo to make his sketches during the observations at night, under the dim light of a candle, and his eyes had to adjust continuously between the eyepiece and the paper; but the telescope could not provide detailed image of the whole Moon, so that the different parts had to be pieced together. Finally, it is important to note that the sheet of paper was turned over different sessions, but the drawings are not dated, so that the intended *sequence of images* must be derived from an overall interpretation of the observations. Interpretation is open at both ends of production and perception of these images.
- 31 Through the telescope, the Moon appeared like the kind of irregular and imperfect pearl that the Portuguese jewellers of the period called *barroca*—and just like a Baroque pearl, it manifested an ornamental line of speculation that transformed the *science of appearances* in the early modern visual culture. Besides the technical issues, in fact, some details of Galileo’s drawings appear as *intentional deformations*, or even figments of imagination. One of his most surprising inventions can be found in the engravings of the Moon for the *Starry Messenger*. In the lower part of the *terminator*, i.e. on vertical line that divides the dark from the sunlit side of the Moon, Galileo draws a large crater that cannot be clearly mapped on the lunar surface, but it is so prominent that it should be visible with the naked eye. Its representation would have enthused any Baroque painter, but it is not a real feature. The crater serves as a magnified illustration of the dynamics of light and shadow on an irregular, concave surface, creating a dramatic contrast with the equally textured but convex surface of the Moon. We can contrast it with one of Galileo’s wash drawings (Florence, MS 48, 28r), where the detail of a crater appears next to the Moon. In this position, detached and enshrouded in a light brush stroke, the detail may be interpreted as a separate celestial body, something like a *comet*—unless one wants to consider it as a simple blot of ink. By suggesting a connection between the crater, as a detail of the Moon, and the representation of a comet, as a distinct celestial body moving close to the Moon, we may gain some insight into the *semiotics of cosmological observations*.
- 32 In this interpretation, the detail of the crater functions as a *starry enunciator*, and it marks a position in the long debate on the nature of the comets. The passage of these *eccentric bodies* in the sky introduced the possibility of *movement and change* in the representation of the universe, extending the experience of the sublunary world to all celestial bodies. As the comets appeared to be moving without showing any measurable parallax, astronomers generally concluded that they were located beyond the sphere of

the Moon. Galileo's alternative explanation was that they were "mere appearances", and more precisely *effects of reflection* of the sunlight on earthly vapours—something like the rainbow, which does not seem to change position when we move. This erroneous conclusion was consistent with a certain idea of *objectivity*. In his *Discourse on the Comets* (1619), in fact, Galileo argued that parallax "operates reliably in real and permanent things whose essence is not affected by anyone's vision", but it "does not function in mere appearances" (1960: 36-37). In the apparent absence of the *minimal signs of parallax*, the discourse "of" (*delle*) the comets becomes part of a *history* of the moving images, a fiction of "wandering simulacra" (*ibid.* 36).

- 33 The detection of enunciation marks in cosmological observations can be compared with the interpretation of the *spots* that appear on the Moon—the "dark signs" (*segni bui*), as Dante called them (*Paradise* II, 49). These spots could always be seen with the naked eye, and they elicited various speculations on their origin and meaning. In essence, they were understood as marks of the threshold position of the Moon between the dark matter of the Earth and the crystalline substance of the higher spheres, with the relative moral connotations. Despite being clearly visible and coloured by interpretations, the lunar spots remained absent from painting until the early modern period, when the arts pursued "a true naturalism based upon an empirical appreciation of the beauty, form, and concreteness of earthly phenomena" (Montgomery 1999: 63). In fact, as Gombrich argued for the "discovery of appearances" in the Renaissance, a more realistic representation of the Moon was due "not so much to a careful observation of nature as to the invention of pictorial effects" (1960: 279). The main pictorial effects that enabled this realism can be linked to the new understanding and use of parallax.
- 34 One of Kepler's "artful observations" is exemplary to see how the *discovery* of the lunar spots in early modern painting manipulates parallax effects to disentangle the enunciation marks of the observer. Using a set of telescopic lenses in a *camera obscura*, in 1604 Kepler reported that "the Moon made an image of itself" (*se ipsam pingebat*), as if painting itself on a piece of paper (2000: 259). In this process, not only the "underlying paper" (*subjecta papyrus*) replaces the observer as a *subject*, but "it was from moving the paper that the spot was first discovered" (*ibid.*). The "spot" (*macula*) is compared to the round-shaped Hebrew letter Samech, breaking with the pareidolic tradition of the *face of the Moon*. As the *identification and interpretation* of the spot are derived "from the movement of the paper" (*ex motu papyri*), we can say that it is "discovered" (*agnita*) once it is *differentiated* from possible marks of the projection surface, namely from the enunciation marks of the observer as a *moving subject*. Through *artificial parallax*, in other words, Kepler's observation demonstrates the *semiotic reality of the image*. This is a significant difference from Brunelleschi's device, which required a fixed position of the observer to create the illusion of reality. At the same time, this is consistent with a circular argument on the *apparent absence of stellar parallax*, where the enunciation marks of a moving observer cannot be differentiated from the process of observation and are deleted or concealed in its *history*.
- 35 While conceding that the study of "visual differences" (*visuali differenze*) is essential for the analysis of appearances, Galileo argues that it cannot provide sufficient evidence to discriminate between images and *real things*. In his pamphlet on the comets, he endorsed the position of "the monkey that firmly believed he saw another monkey in a mirror", only to hold on a definition of reality as what lies "behind the mirror" (1960:

232). The monkey is an artless Narcissus: “if simple appearances can determine the essence of a thing”, as the astronomer writes of the apparent lack of parallax of the comets, then we can believe that “the suns, moons, and stars seen in still water or in a mirror are true suns, real moons, and actual stars” (*ibid.* 233). In this way, Galileo set himself on a divergent trajectory from the arts of his time, to the point of ignoring Kepler’s interpretation of the cosmological motions out of an “aesthetic attitude” (Panofsky 1956: 13). To be sure, as modern perspective put painting in front of a mirror, the Baroque elaborated on the classical trope of art as the “ape of nature” and redefined realism as a “wise imitation” (*imitatio sapiens*) of appearances, as suggested by Giovanni Bellori (2015: 215). It was the art of a “semiotic animal” (Eco 1986: 202).

4. Bruno’s semiotic embrace: the stars and the minds

- 36 An aesthetics that explores the possibility of representing the *change of perspective in images*, while assuming this change as a seal of realism, logically foregrounds the role of *memory* to provide unity and continuity to the visual experience. In the late Renaissance, we find in Giordano Bruno’s work one of the most innovative elaborations of the “art of memory” (*ars memoriae*). With the methodological openness of semiotics, which enabled a transdisciplinary or even *heretical* research in the arts and science of his time, he developed a system of “cosmic memory” (Wildgen 1998) from a theory of the *movement of images*. His vision encompasses the cosmological and the cognitive sides of the Copernican revolution—“the stars and the minds” (*astra mentesque*), as Cicero wrote of Aristotle (*Academica* I.vii, 26); and his legacy reaches into the project on the early modern memory of classical images that Warburg called *Mnemosyne Atlas* (1924–1929).
- 37 Bruno’s art of memory is condensed in his last published work, *On the Composition of Images, Signs and Ideas* (1591). The encyclopaedic ambition of this little book is matched by its esoteric complexity, and the author warns that “probably no one will comprehend everything in all modes, unless [s]he shall also perhaps so believe” (Bruno 1991: 6). The system thrives on the “marvelous kinship” of the arts: “For true philosophy, music or poetry is also painting, and true painting is also music and philosophy” (*ibid.* 129). Dick Higgins and Charles Doria introduced it as “intermedial, as it were, between philosophy and work of art” (*ibid.* xlviii). In fact, this book is profoundly intermedial in its method, which marks a *semiotic turn* in philosophy (Sturlese 1990). Through semiotics, the art of memory becomes a method to *think in images* and a model of “how images think” (Burnett 2004). The sublime *simplicity* of metaphysics, in which the mind can “enfold itself” in images without sensible mediations (Bruno 1991: 4), is turned into an art of *semiotic complexity*, which discloses the mind’s “embrace” (*complexus*) of *sense* as “the condition of those things that do the signifying” (*ibid.* 31).
- 38 With an Aristotelian formula, Bruno starts from the principle that “for one who wishes to know something, it is proper to speculate on the phantasm” (*ibid.* 18), namely on the *images* that “imagination” (*phantasia*) draws from the senses, called *phantasmata*. In general, these images may be defined by contrast with *pictures*, as William Mitchell suggests, precisely as “what can be lifted off the picture” and transferred onto different media (2005: 85). In the Neoplatonic tradition, which tinges Bruno’s Latin sources and overall views, the *allegory of the cave* represents the process that inscribes the *shadows of*

image formation in the life of the mind. In this regard, Bruno's art can be closely compared to that of his contemporary Giovan Battista Della Porta, a professor of secrets who became famous all over Europe with his book on *Natural magic* (1558). In his *Art of Remembering* (1566), Della Porta writes that memory images are "animated pictures" (*pittura animata*) of the world that are projected, through the "windows" of the senses, into the *camera obscura* of the head: like a painter, imagination fixes them on that "lively canvas that we call the brain" (2012: 89, 98). Similarly, Bruno writes that imagination is, like a painter, an "establisher of infinite images" on the "surfaces of sense" (1991: 129)—although a simple (and not unusual) print error may have changed the "formative power" (*efformator*) of imagination into an "establisher" (*effirmator*) of images. *Analogy* is what allows the philosopher to connect "surfaces and essences" (Hofstadter & Sander 2013).

- 39 In more technical terms, we should understand Bruno's images with the Aristotelian analogy that thinking is like "making a diagram" (*De memoria* 450a3). In his art of memory, accordingly, to think means to *speculate on diagrams*. These are "moving pictures of thought", as Peirce called them (CP 4.8), but they do not have only a logical function, as they draw on the *sensible complexity* of the arts to make "imagination pulsate and move" (Bruno 1879-1891: II.1, 229). We can find numerous and remarkable diagrams in Bruno's works. Many of them are etched by his own hand and printed in *reverse or negative*, namely as white lines on a black background. Not only was this technique easier for a non-professional carver, as he was, but it reveals a certain way of thinking in images, which converges to the aesthetics of the Baroque: the white lines set the "moving pictures of thought" against a dark cosmic background, like astrological maps or the photos in Warburg's *Atlas*. Also, these diagrams are richly *ornate*, combining geometrical shapes with symbolic natural forms, like flowers, hearts and stars, in a kind of *living geometry* that Bruno called "zoometry" (Yates 1964: 343). Unfortunately, the modern editors of his Latin works converted his diagrams into positive prints, with black drawing lines against a white background, and removed what they saw as meaningless flourishes. The *speculative value of the ornaments* was lost, as it was in the white, quiet, and idealized simplicity of Neoclassical statues.
- 40 One of the fundamental diagrams of Bruno's system is that of the *atrium*, imagined as the open-sky courtyard that lets light into the temple of Mnemosyne. From these courtyards and the relative cubicles and fields, as Frances Yates commented, Bruno builds "an architectural system of terrible complexity" (1966: 295). This is not just a system of rooms and places to store images, like paintings or statues in the classical art of memory: it is the *movement of the mind* in this imaginary space that makes the *sense of images*. As in a Copernican version of Leonardo's "Vitruvian Man", the architectural square of each atrium is combined with the circular orbits of the planets and the stars, ornate with signs and associated with mythological figures that orient interpretation. At its centre, Bruno places "the earth and the eye" (1991: 46), namely matter and mind: the whole universe is seen from this *double, living, and impersonal centre of speculation* – and it is suggestive that the Vitruvian architecture would expect a shallow pool of rainwater at the centre of the atrium.
- 41 In its "full significance", as Bruno writes, the universe is "a sort of living mirror" (*speculum quoddam vivens*), in which the mind finds "the image of the natural and the shadow of the divine" (*ibid.* 10). The philosopher upholds the teaching of the apostle Paul (1 *Corinthians* 13:12): "now we see through a mirror, darkly" (*di' esoptrou en*

ainigmati), as on a surface of polished metal. However, the *obscure and indirect vision* of the world, as we experience it “now” (*arti*), is re-enunciated as a principle of aesthetic knowledge: we think *in* images, through the shadows that reveal the substance of images. The signs of the *divine presence*, apparently absent to the senses, can be disclosed by means of “discourse and reflection” (Bruno 1991: 5). And the possibility of seeing the truth and beauty of the world “face to face” (*prosōpon pros prosōpon*), which the apostle deferred to the time of revelation, is raised with a *cosmic vertigo* of the mind that speculates on images, facing the universe as in a cosmic Brunelleschian device.

- 42 The analogy of the mirror is semiotic in multiple ways. First, it is used to manipulate the difference between *real presence and representation*, as Lotman explains: “A face in the mirror does not share the natural associations of a real face—it cannot be touched or caressed, but it can easily be included in semiotic associations—it can be abused or used for magic manipulations” (1990: 54). As such, the mirror enables Bruno to develop an “analogous definition of the arts of memory and magic” (Mertens 2018: XV). The mirror also functions as a *plane of signification* that captures the “movement of images” (*imagination momentum*), as Bruno writes (1991: 16). Before and beyond representation, images signify the connection of all things in a continuous, infinite process of interpretation and transformation, from the invisible elements to the point-like distant stars. The art of memory aims to harness this process of universal semiosis. Bruno cannot present in detail the system of “vehicles and chains” (*vehicula et vincula*) that reflects the movement of the stars and the minds at different semiotic levels of *immanence*, “as in a mirror” (*ut in speculo*), but he is eager to make the point that “the planets seem to seek out similar faces to their own in subjective and informing things according to the counsel and practice of the Magi” (*ibid.* 17).
- 43 In the cosmological embrace of the art of memory, the Moon is marked as a “subjective and informing” threshold of Bruno’s speculations—and it is a felicitous convention that one of its rayed craters on the far side now bears his name (Saiber 2005: 44-45). Like a mirror, the Moon is an “intermediary body” (Coccia 2016: 16) of the cosmic life of images. As it reflects both the light of the Sun and the shadows of the Earth, it also combines the *movement that is “signified in us”*, as Ficino put it, with the *movement that we signify in images*. Bruno writes that the mind ascends from the sensible shadows to the divine ideas, and vice versa it descends, “in the same way that we descend from the Sun to the aspect of the Moon’s light, which is imparted by the stars and the air, and from it we move down to the shadowy light, or as in a mirror” (1991: 16). This *cosmic movement of images* gives a new spin to the Platonic idea of “saving the phenomena”, as debated in Plutarch’s dialogue on *The Face that Appears on the Moon* (923A), namely to the effort of saving the motions of the celestial bodies from the quality of mere *appearances*, as they would be if the universe was at rest while the Earth in motion.
- 44 For Bruno, in fact, the Earth and the Moon are not only similar, but they form a semiotic system of *double planets* that is pivotal to his view of the whole universe. This may be well illustrated by a striking misreading of a Copernican diagram. In a passage of the dialogue entitled *The Ash Wednesday Supper* (1584), Bruno argued that the small *point* that we can see on the third celestial sphere of that diagram did not “mean” (*significava*) the position of the Earth, but simply “the mark made by the foot of the compass during the drawing of the epicycle of the Earth and the Moon: the epicycle being the same for them both” (2018: 165). He was wrong, both from the physical and the philological point of view, and yet somehow coherent with the Copernican way of

rethinking the universe by way of “eccentrics and epicycles” (1985: 81). In his misreading, not only the Earth is displaced from the centre of universe and replaced by the Sun, but its *meaning and position* are determined on the same epicycle of the Moon.

- 45 Crucially, this system of double planets allows Bruno to extend the evidence of the Moon’s parallax to all the celestial bodies, including the so-called fixed stars: their lack of observable parallax cannot be an indication of the Earth’s immobility, and it must be due to their distance. We know that Galileo will try to measure stellar parallax with the technique of the “double stars” (Hirshfeld 2013: 132), but he could not obtain solid evidence; instead, he used the *movement of water* during the tides as “an *Ersatz* for parallax” (Koestler 1959: 465), although he discarded the correct theory of the gravitational attraction of the Moon. Like Galileo, Bruno suggested that “the Moon is a sign of these things, but not their cause” (2018: 175). They were wrong for the tides, but their semiotic argument may still be valid: we are always looking at a finger that points at the Moon, when we are observing parallax, namely we can only speculate on images.
- 46 By embedding parallax in the *composition of images*, Bruno expands the art of memory from a static model, which “does not interchange [*ou parallattousi*] the signs of the senses”, as we read in Plato’s *Theaetetus* (194d8), into a dynamic, cosmic and creative system of visual semiotics. In this system, the meaning of images is not the *representation* of things, but a *positional figure* of the mind relative to an *impersonal substance of signification*, which “abides in movement and quantity, even if by itself it neither moves nor is moved” (Bruno 1991: 4). With Jacques Fontanille, we can say that this is a system of “living signification”, centred around “a *perceiving body that takes a position* in the world of meaning” (2006: 1-2). As it takes position, the living body modifies the *field of presence*, and memory retraces these *sensible deformations* in images.
- 47 A positional reading of Bruno’s composition of images can be further developed from the Aristotelian distinction between general “memory” (*mnēmē*), which is based on the retention and recovery of sensible impressions, and “reminiscence” (*anamnēsis*), whose object is the initial “motion” (*kinēsis*) of a *sequence of changes* in our body that generates an “idea” (*De memoria* 451b12-25). In reminiscence, as Aristotle writes, we “hunt” (*thēreuomen*) for ideas, as we follow the *sensible, temporal inscriptions of our body in images*. Neoplatonic reminiscence elaborates on this cognitive model with the metaphor of the *dark woods* that represent “matter” (*hylē*), and understands “the practice of philosophy as a process of tracking, pursuing and hunting the traces of divine presence in the material world” (Rowland 2002: 111). This is for Bruno the essence of a semiotic art: memory is a system of *uttered enunciation*; reminiscence tries to capture the “impulse to signify” (*motum significatum*), as he calls it (1991: 24), which inscribes the *process of enunciation* into the forms of “signified memory” (Dondero 2020: 30, n. 40). The philosopher is after the movement of ideas, not the similarity of *icons*.
- 48 The myth of Narcissus takes on a whole new meaning in this context. A painting of the beautiful hunter appears at the heart of Panel 34 of the *Mnemosyne Atlas*, in a sequence of tapestries dedicated to hunting and dated 1929, when Warburg discovered Bruno as a “thinker in images” (*bildhafter Denker*) (WIA, GC/22737). If we define a myth as a *memory-enhancing narrative*, Narcissus represents for Bruno the speculative mind that fails to embrace itself on the mirror of nature—while the cognate myth of Actaeon, who sees the goddess Artemis bathing in the spring of a sacred cave, expresses the understanding of their identity, the hunter becoming prey, as Bruno explains at length in his *Heroic Frenzies* (*Eroici furori*, 1585: 1.4). At the same time, the *apparent failure of*

identification of Narcissus with his own image is a force of “living enunciation” (Fontanille 2006: 36), which inscribes the gaze of the hunter in a transformative point of view of the image on itself. It is *heroic* in its own semiotic and speculative terms.

- 49 In Bruno’s work, significant references to the myth of Narcissus can be found in two *scientific poems*, published in the same year as his book on *Images, Signs and Ideas*. In the first poem, on the invisible elements (*De minimo*, 1591), Bruno conceives the atom as a “minimal mirror” (*minimum specillum*) of the universe, and argues that the science of his time could not fathom this *minimal, reflexive and impersonal point of view*, “just like Narcissus his face, the body its shadow” (1879-1891: I.3, 235). We can say that the shadow stands for the “minimal difference” of an object relative to itself, as in Žižek’s definition of the parallax view (2006: 18). This is complemented by the second poem, devoted to the immensurable and “unfigurable” universe (*De immenso*, 1591): its *visible limits* ultimately coincide with the lack of observable parallax of the so-called fixed stars. Here, Bruno writes that the shadow is a “vertigo of the body” (1879-1891: I.1, 317), and compares the “apparent vertigo of the world” (*apparens mundi vertigo*) to that of Narcissus, who “tries to embrace” his own shadow on the “underlying waves” (*in undis subiectis*): between the subject and the shadow there is “nothing but the plane” (*praeter planum nihil*); images move on it like waves on a “sheet of water” (*nappe d’eau*), as in Saussure’s diagram of the semiotic plane (1966: 112).
- 50 In this reading, the star-crossed embrace of Narcissus contains a *vertiginous parallax view* of the Copernican universe. When we experience vertigo, that is, our head spins and the world around us seems to move, while the ground under our feet fluctuates. In a similar way, when Bruno explains the motion of the celestial bodies, the parallax view is a way of embracing the “imaginary face” of *phantasmata*, as he writes, and this face is as *real* as the reflection of the “fortress of reason” on the “font of sense” (1879-1891: I.2, 25). Two centuries before Kant’s “Copernican revolution” in the way we think about *phenomena*, Bruno suggests that we can only *speculate on phantasmata*. With this, the apparently absent parallax of the stars is inscribed in the movement of images as a structure of *desire* (*de sideribus*), for “everything which desires or lacks something moves towards the thing desired, and—as far as possible—converts itself into it” (Bruno 2018: 174).

5. Caravaggio’s poetic invention: what is it like to be an image?

- 51 In the transition of the Renaissance from the empirical “world of the more-or-less” (*monde de l’à-peu-près*) to the modern “universe of precision” (Koyré 1971), science still was, and crucially, an *art of approximations*. At the same time, painting could hold an even stronger claim to *realism*, since the technical advancements in the production of optical instruments enabled the projection of images from the real world onto canvasses. In the development of modern realism in painting, around 1600, Caravaggio represents a defining case in point. His Roman patron, Cardinal Francesco del Monte, owned copies of the optical writings of Leonardo and Della Porta, among others, and some of the finest mirrors of the time. As always, changes in the relationship between perception and modes of representation do not follow from an individual style, but Caravaggio captured the “period eye” of the Baroque with the vision of an avant-garde artist.

- 52 According to a controversial yet reasonable and documented hypothesis by David Hockney, Caravaggio's Roman canvasses display the marks of a dramatic advance in the optics of the *camera obscura*. The refinement of concave mirrors and convex lenses, which project a *real image* on a surface—instead of the *virtual image* located behind a flat mirror—, enabled Caravaggio to develop his paintings directly on the canvas, without preliminary drawings, using little incisions and white touches as reference points through different sessions. Despite the unease of painting images upside-down, the geometric visions of the Renaissance became more lifelike. The intellectual mastery of drawing gave way to a new sense of colour that was, at once, emotional and materialistic, endowing figures with softer contours and stronger contrasts. With the best lenses of this period, however, the maximum usable image was 30cm across (Hockney 2006: 103)—a measure that coincides with that of Brunelleschi's perspective panel. Bigger canvasses had to be composed through a *montage* of different parts, like Galileo did with his drawings of the Moon. The *cinematic* nature of this montage opens Caravaggio's paintings to a dynamic analysis of their structure (Careri 2016), but the *moving focus* also caused the formation of perspective “errors”, as Alberti would call them. While these errors may be interpreted as stylistic choices, as some critics have suggested, it can be safely argued that the new technique introduces *parallax effects* in painting, and it does so through an *impersonal device* that inscribes a *movement of reflection* in the composition of images.
- 53 The use of optical devices in Caravaggio's painting is no longer “secret knowledge”, as Hockney presents it and as it was for Della Porta (Lapucci 2005). Caravaggio's contemporaries witnessed that he transformed his studio into a dark room, making a hole in the ceiling to create a direct and intense source of sunlight. Recent studies show that he also used light-sensitive chemicals in his colours, like silver salts, which allowed him to work in the dark during the projections. His ceiling painting of *Jupiter, Neptune, and Pluto* (ca. 1597), in the distillery of a villa owned by Del Monte, suggests “a process that could chemically-fix an image created inside a *camera obscura*”, as Susan Grundy explains: the three gods respectively signify sulphur (air), mercury (water), and salt (earth), while the “significant ingredient of silver (as a salt, iodide or nitrate) is alluded to by the presence of the Moon”, depicted at the centre of “a crystal-like ball, which could itself be a reference to a lens” (Hockney *et al.* 2009: 31). The gods appear in audacious foreshortening from below, and it is likely that they are based on *self-portraits* of the painter as seen on a flat mirror on the floor. This the only ceiling painting by Caravaggio, but it provides a broader context for the cosmological vision that he developed from the alchemy that made *sublunary bodies* shine like stars.
- 54 Although overlooked by Hockney, a small canvas acquires a paradigmatic position in this history of optics in painting. This is also one of the most “Brunian” of Caravaggio's works (Ordine 2009: 231-241), belonging to the decisive period when the philosopher was in Rome—before his “emphatically manneristic” burning in 1600 (Panofsky 1995: 67). The painting is the *Narcissus* (ca. 1597-1599), re-discovered by Roberto Longhi at the beginning of the twentieth century and attributed to Caravaggio as one of his “most personal poetic inventions” (1999: I, 213). Promoting the analogy of cinema in art history, Longhi suggested that the painter's “descriptions of light and shadows” are, precisely, “photograms” of a film (*ibid.* 69). His pupil and film-maker Pier Paolo Pasolini pushed the analogy further, and wrote that Caravaggio invented “profilmic” painting, in which the *reality as a whole* is reflected as in a “cosmic mirror” (1999: 2674), from the

hole of an apple to the eye of an angel. The *Narcissus* stages the representation of this profilmic, cosmic mirror inside the painter's *camera obscura*, with a *cinematographic* meditation on temporality, presence, and transience.

- 55 The myth of Narcissus was notably associated with the art of painting by Alberti. As he writes (2011: 46), he liked to say that the beautiful hunter was the “inventor of painting” for two reasons: the first one is that, according to the “whole tale” of the poets, Narcissus was “transformed into a flower”, and painting is “the flower of all the arts”; the second reason is that to paint means “to catch with art that surface of the spring”, as in a mirror. Victor Stoichita noted that “the embracing of the mirror (*amplector/abbracciare*) contrasts radically with the outlining of the shadow (*circumscribere/circonscribere*)”, which was classically regarded as the first idea of painting, because the subject of the reflection is “the same and not the other” (1997a: 39). Caravaggio shows that the contrast may not be as radical as it seems. We can say that his poetic invention is that of a *semiotic embrace of the mirror*, where the same emerges as a minimal difference from its shadows, like Bruno’s memory images painted on the “surfaces of sense”. We do not see the final transformation, the flower that stands for a body, but we do glimpse the “whole tale” from the sombre tones of the reflection. The flower is signified by the “coming to the surface” (*affiorare*) of form from colour, that is, from the *temporal vicissitudes* of light. Longhi wrote that Caravaggio thus inaugurated “a new notion of action” in painting, where “tonal hieroglyphs” replace drawing with “a surfacing of eager gestures that pierce the canvas deeply” (1995: 128); and Françoise Bardon suggested that the *Narcissus* represents a theory of “spatial ‘emergence’”, which can retrospectively be said to consist of a synthesis between Bruno’s materialism and Galileo’s search for general laws” (Bal 1999: 239).
- 56 A translation of Ovid’s *Metamorphoses*, which inspired many artists in the late Renaissance, could be one of the twelve books listed among Caravaggio’s household possessions in Rome. The *Narcissus* interweaves some essential narrative threads of the myth, as told in this poem (III, 337-510), like one of Warburg’s tapestries. The beautiful hunter is transfixed on a “silvery pool” (*fons argenteus*), “hanging motionless” over his own reflection, his eyes burning with desire like “twin stars”. The water is perfectly still and clear; in the darkness of its depths, the boy gauges his destiny and his origin, as the son of a river god and a water nymph. Surrounded by trees and plants, the pool is a kind of natural *camera obscura*. Caravaggio knows “how the likeness of a vision that is seen in the water may be seen hanging without in the air, by the help of certain glasses of diverse fashions”, as Della Porta wrote (1957: 3): the “hanging image” (*pendula imago*) is the *real image* projected by a mirror-lens. This is a new art of shadows, close to the origins of cinema, and its reflections in early modern painting renew the wonder of “the earliest Neanderthal Narcissus” (Edgerton 2009: 24).
- 57 Caravaggio represents Narcissus on his knees, embracing his own image in a full circle, which is almost perfectly divided in two mirroring halves. Prior figurative instances of this pose can be encountered in an illustration of the *Metamorphoses* translated by Lodovico Dolce (1553), or in an engraving by Tommaso Barlacchi (Marini 1989: 443), but the reflection is missing in the first case, while in the second case it is too vague, and we only see the head and the chest. The circular shape is obviously symbolic of “self-love” (*philautia*), which must be here understood without the negative moral connotations of the iconological tradition: for Bruno, it was the fundamental “bond” (*vinculum*) of desire in the movement of images (1991: 283, n. 3); and it captures the

circularity of the experience with mirrors and signs, as discussed by Eco. The semiotics of perception, reflection, and desire flows under the Baroque sense of balance achieved by this painting.

- 58 Over the water line, the two halves appear perfectly symmetrical, but their composition reveals subtle fluctuations. In the first place, we can imagine that Caravaggio painted the figure of Narcissus upside-down, as it would appear by a direct projection in his dark room, namely as it were the reflection in the final painting. The semi-circular figure can be compared to that of the *Conversion of St Paul* (ca. 1600), where the apostle lies on his back, his eyes shut, embracing the divine light like the water of a baptismal font—but this painting is double in size, and the right arm is out of proportion, perhaps because of a movement of the mirror-lens beyond the sweet spot of the usable image. Subsequently, Caravaggio turned the canvas and copied it as the reflection. A vertical incision fixed the position of the body in the lower half-circle. At first sight, the reflection appears simply reversed “as on a playing card”, as Rossella Vodret describes it (1998: 63), just without the rotation that one finds in the modern card designs: this could have been done more easily by repeating the process after turning the canvas. In fact, the reflection is a *modified copy of the image* in the upper half: the distance between the face and the knees is larger, but the overall distance between the shoulders and the water line is approximately the same, so that observers do not perceive this difference immediately. The reflection is a space for pictorial thinking, and the *pentimenti* are markers of its *process of enunciation*.
- 59 Reflectography shows that both knees were originally painted in the reflection, and they initially anchored the “guesswork” of the painter (Cardinali 2019: 61). This is a significant change. When Caravaggio moved the reflected knees upwards, as in the final composition, the receding plane of the clothed knee disappeared under the water line, signifying *depth and death* at once. In this sense, the bare knee performs the semiotic function of “providing a semblance of presence to absent beings” (Damisch 2010: 304), which was for Alberti the essence of a portrait. More precisely, it makes present a *double absence*, as explained by Mieke Bal: the disappearance of the *other knee* in the darkness of the pool, and the lack of *another head*, as the knee looks like “a neck without a head on it” (1999: 243). In the materiality of its colour, which condenses the light of the golden background of Caravaggio’s *Basket of Fruit* (ca. 1597), the bare knee is the “golden core” (*croceum medium*) of the transformation, the sign of a flower that will take the name of Narcissus, while his body melts away like wax under the sun. We can find a suggestive correspondence in the *Conversion of Mary Magdalene* (ca. 1598), where a window is reflected as a square of light on a convex mirror: in a frontal view of this mirror, the light would appear at the centre of the semi-circle of the hand, like the knee of *Narcissus* is at the centre of the embrace.
- 60 With its reflection, the knee marks a *double and impersonal centre* of the painting, like “the earth and the eye” inscribed at the centre of Bruno’s atrium—and like the foot of a cosmic compass, it signifies the apparent failure of identification in the *epicycle of the heads*, where *Narcissus* embraces the Moon. Against a cosmic background, in fact, the bare knee looks like the faint reflection of a disappearing Moon that we can detect in the spring of Caravaggio’s *Rest on the Flight into Egypt* (ca. 1595). A revelatory term of comparison is the *Flight into Egypt* by Adam Elsheimer, painted in Rome in 1609. Here, the silver light of the Moon gives the sense of direction to the whole scene, which unfolds from right to left, and the night setting allows Elsheimer to display a clear

parallax effect on the vertical axis: the Moon reflected on the water is not perpendicular to the Moon in the sky, and it appears in a different position relative to the trees. Likewise, in the *Narcissus*, the reflected knee is moved upwards, trying to integrate the different points of view of the water and the observer. The main reason for Caravaggio's changes in the reflection is, precisely, the *imitation of a change of perspective*, namely an effort to include *parallax effects* as markers of realism.

- 61 Despite Caravaggio's adjustments of the reflection, a photograph of the same scene would display a very different view, showing the lower part of the chin, the nostrils and, more importantly, the open eye looking at itself. A little sketch of *Narcissus* by Cigoli (Louvre, INV 905r)—who also painted the first Galilean Moon from telescopic observations—shows the reflection on the water as it would likely appear to an external observer. “Painters often deceive themselves, by representing water in which they make the water reflect the objects seen by the man”, as Leonardo had already noted (1970: 239): in other words, painters cannot represent what “the water sees” (*l'acqua vede*) by simply reversing an image. From the point of view of both the observers and *Narcissus*, we should expect something like the ceiling painting in Del Monte's villa. One wonders why Caravaggio did not use the same technique. Part of the answer is that the reflection of *Narcissus* is not just the view of a *delegated observer*, but the observer is a *delegated Narcissus*. Caravaggio exploits the painter's self-deception to a greater effect: the observers of the painting are not meant to see the reflection of a real body, but an *image that sees itself as a real image*. The difference goes easily unnoticed, the painter deceives the observers in plain sight, as he did in *The Cardsharps* (ca. 1595): in the triangle between the internal and the external point of view, the value of the cards that we cannot glimpse can be derived from all the other cards that we see.
- 62 This raises an important point on Caravaggio's realism. “Given the non-realistic nature of the reflection”, Vodret suggests that “this *Narcissus* may even be a self-portrait executed using two mirrors” (1998: 60). One of the advantages of this hypothesis is that it helps to move away from the principle that the realism of the reflection depends on the *similarity of the head*, while the painter makes us focus on the pivotal *difference of the knee*, as it is expressed in its parallax. To be sure, the “hanging head” in the reflection of *Narcissus* is as *real* as that of the giant in Caravaggio's several versions of *David and Goliath*, and this head is often identified with that of the painter. There are two notable examples: in the earliest version (ca. 1597-1599, Madrid), the composition of *David's* body “like a spanner” (*a chiave inglese*) conjures the embrace of *Narcissus* (Longhi 1999: II, 89); in one of the last versions (ca. 1609-1610, Rome), Caravaggio painted the head of *Goliath* as “a portrait of himself” (Bellori 2005: 182), and *David* is a *messenger* asking the revocation of the papal price on the painter's head. It is a form of *indirect discourse*: the painting says that *this* is the head of the painter.
- 63 The focus on the knee allows us to disengage the *supposition of self-portraiture* from the assumption that “every painter paints himself”, which was an *idée reçue* of the Renaissance. What emerges is a structure of *reflexive but impersonal enunciation* that performs the double meaning of a *signum*, as Ovid calls it, namely a “statue” and a “sign”. In this respect, it is relevant that the pose of *Narcissus* may also be based on two lost ancient statues, and the head inspired by a Roman statue that was widely imitated in the Renaissance, perhaps from a copy in Del Monte's collection (Marini 1989: 442-443). The sources are multiple and, precisely, speculative. We can say that the reflection of the knee articulates the minimal difference of a *real image* as a *sign of itself*,

and this difference coincides with the coming to the surface of plastic values in painting.

- 64 As much as the knees, the two eyes that we see in the painting are those of a profile in reflection. This is not a monocular projection, but a representation of the difference between two points of view over a *plane of living signification*. This is an essential semiotic strategy that Caravaggio employs for “the destruction of historical representation through a display of the eye that sees and stupefies itself”, as argued by Louis Marin (1995: 29), and it also shows how the semiotics of the “living mirror” replaces metaphysics, as Bruno described it. In the first place, the observer is nothing but a *double of the image that sees itself*, not a virtual substitute of the painter’s point of view, as it is generally assumed. It can even be argued that the circular composition, just like a mirror-lens, transforms the observers into projections of the painting. The failure of identification is only a matter of point of view, then, and it enables a new kind of *felt imitation*: Narcissus embraces his own *substance* as “the shadow of an image” (*imagineis umbra*), as Ovid writes. In fact, what the beautiful hunter tries to capture is not one single, still image, but a sequence of “fleeting images” (*simulacra fugacia*), a living *phantasmagoria* of himself. The comparison with cinema is inevitably imprecise, but it offers a good approximation to the poetics of Caravaggio’s painting.
- 65 The comparison can be developed with a key idea from Pasolini’s film semiotics, which displays a Brunian art of “heretical empiricism” with a Caravaggesque sense of realism. This idea concerns one of the most prominent techniques of a “film of poetry”, namely the “free indirect point-of-view shot” (*soggettiva indiretta libera*), as Pasolini calls it (1988: 176), by analogy with the *free indirect discourse* of a literary text. It is a form of *subjective but impersonal enunciation*, in which “somebody says [or sees] that somebody else says [or sees] the same thing” (Paolucci 2010: 409-410). In Ovid’s poem, the reflection is inexorably silent, but it returns all the “signs” (*signa*) that Narcissus makes; he sees all the movements of his body while his eyes appear fixed on himself, so that he *feels* to be the moving image that he sees in a subjective, impersonal and reflexive act of identification: “I am he! I have felt it” (*Iste ego sum! sensi*). Caravaggio achieves a similar effect with his *camera obscura*: the reflection makes us feel the actions and passions of the image, interweaving the gaze of the observer with that of Narcissus “like a Persian carpet” (Pasolini 1988: 89). We observe a certain scene as if we were inside it, but we also “feel the camera”, as Pasolini writes, so that we can experience our point of view as a *pure difference* within a *discourse that reality makes on itself*.
- 66 By way of a tentative conclusion, we can say that a new observer emerges inside Caravaggio’s *camera obscura*. As the background is reduced to a dark cosmic surface, the reflection shifts from optics to semiotics. The *movement of the observer* is inscribed in an image that appears motionless but sees and feels itself as a moving image—more precisely, an *image that moves relative to itself*. Through this experience, Caravaggio invented a new archetype of the “self-aware image” (Stoichita 1997b), one that allows us to rethink the emergence of a “Baroque consciousness” (Kersten 1997) from an *impersonal and reflexive point of view* in the process of visual enunciation. A *semiotic consciousness of images* comes to the surface, and its rule of thumb can be expressed with Thomas Nagel (1974), as follows: we may assume that something is conscious if there is “something that it is like” to be that thing. Narcissus learns *what it is like to be an image*, and perhaps we can learn from its reflection that “we all are waves” too, as Welby made us consider (1983: xvii).

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ABSTRACTS

This essay develops a comprehensive approach to the study of parallax effects in early modern images, with critical emphasis on painting. Parallax is the apparent displacement of an object relative to a given background, as caused by the movement of the observer. In the cosmological debate that accompanied the Copernican revolution, the apparent absence of stellar parallax was taken as decisive evidence against the hypothesis of the motion of the Earth. Surprisingly, the emergence of a parallax view in the early modern arts has not been considered in relation to this crucial scientific debate, and it is still largely understudied. In this context, this essay puts forward a twofold argument: first, it contends that the debate on stellar parallax informs, integrates, and transforms the theory of perspective in the late Renaissance; second, it argues that the parallax view sheds new light on the representation of movement in the Baroque visual culture. The semiotic model of uttered enunciation provides a methodological framework to study the inscription of a moving observer in images, and the question of the semiotic nature of mirrors finds here a new pertinence. This framework is developed with a focus on Giordano Bruno's art of memory, where the parallax view enables a semiotic embrace of the movement of images. In painting, analysis focuses on Caravaggio's *Narcissus*, where the observer is displaced to reflect the point of view of an image that appears motionless but sees itself as a moving image.

Cet essai développe une approche d'ensemble pour étudier les effets de parallaxe dans les images de la première modernité, en portant une attention critique à la peinture. La parallaxe est le déplacement apparent d'un objet par rapport à un arrière-plan donné, dû au mouvement de l'observateur. Dans le débat cosmologique qui a accompagné la révolution copernicienne, l'absence apparente de parallaxe stellaire était considérée comme une preuve décisive contre l'hypothèse du mouvement de la Terre. Il est surprenant que l'émergence d'une vision de parallaxe dans les arts de la première modernité n'ait pas été prise en compte par rapport à ce débat scientifique crucial, et elle est encore largement sous-étudiée. Dans ce contexte, cet essai présente un double argument : premièrement, il soutient que le débat sur la parallaxe stellaire informe, intègre et transforme la théorie de la perspective à la fin de la Renaissance ; deuxièmement, que la vision de parallaxe jette une nouvelle lumière sur la représentation du mouvement dans la culture visuelle du Baroque. Le modèle sémiotique de l'énonciation énoncée fournit un cadre méthodologique pour l'étude de l'inscription dans les images d'un observateur en mouvement, et la question de la nature sémiotique des miroirs trouve ici une pertinence nouvelle. Ce cadre est développé à travers l'art de la mémoire de Giordano Bruno, où la parallaxe permet d'embrasser le mouvement des images d'un point de vue sémiotique. En peinture, l'analyse se concentre sur le Narcisse de Caravage, où l'observateur est déplacé pour refléter le point de vue d'une image qui semble immobile mais se voit comme une image en mouvement.

INDEX

Mots-clés: discours scientifique, énonciation, peinture, réflexivité, mouvement

Keywords: scientific discourse, enunciation, painting, reflexivity, movement

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